Section 56 Signs

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Signs

4-5601 General

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Signs and sign structures are of various types, from simple roadside signs to complicated sign bridges containing changeable message signs. The resident engineer must apply the correct inspection to ensure the contractor installs signs and sign structures to function properly.

4-5602 Before Work Begins

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Before work begins, take the following steps:

- Review the plans and specifications to determine the types of signs to be installed and any special requirements included in the contract.
- Verify the receipt and proper distribution of Form CEM-3101, "Notice of Materials to Be Used," which covers signs.
- If required, before the manufacturers furnish the materials, obtain from the Office of Materials Engineering and Testing Services (METS) an approval of foreign manufacturers. (Refer to Section 6-1.08, "Foreign Materials," of the *Standard Specifications*, which covers the use of foreign materials.)
- Refer to the contract specifications and Section 3-605, "Certificates of Compliance," of the *Construction Manual* (manual) regarding provisions of the Buy America requirements.
- Obtain working drawings, including, but not limited to, anchor bolt layouts, shop details, erection plans, and equipment lists for sign structures as required by the contract. With the assistance of the structure representative, review these working drawings and approve them if they comply with the contract. To review the working drawings of changeable message signs, refer to Section 168-3.1, "Shop Plan Review for Changeable Message Sign (CMS) Structures," of Volume II of the *Bridge Construction Records and Procedures Manual*. After review (and correction if necessary), return one set of the working drawings to the contractor with the following statement: "The plans are approved pursuant to Section 5-1.02 of the *Standard Specifications*."
- Do a field review of all sign locations, and check for possible conflicts with other structures, electrical and irrigation lines, and underground and overhead utilities. Ensure adequate horizontal and vertical sight distance. Trees or other landscape features may need to be trimmed to obtain adequate sight distance. Advise the contractor of any changes, and if necessary, prepare contract change orders. In addition, because relocating signs can impair or nullify their effectiveness, consult with the district traffic unit whenever changes must be made or the effectiveness of any signage is questionable.

- After control stakes have been placed, ensure the markings have the following:
  1. The correct span lengths
  2. The correct elevation of footing pedestals (usually 75 mm above the finished grade or the top of curbs)
  3. The minimum vertical clearance shown on the plans
  4. The required cover over the tops of footings
- To ensure incorporation into the work during shop fabrication, give the source inspector any changes that revise materials, specifications, or structural design. Normally, METS is notified of any changes through the receipt of a copy of the contract change order. However, allow sufficient lead time for the normal distribution of contract change orders. If changes are under way based on a "prior authorization," the resident engineer may need to send the revised specifications or drawings directly to METS in advance of the approved contract change order. Resident engineers should call METS to confirm receipt of the changes.
- Review the contract for any requirements for state-furnished material. Resident engineers must ensure that state-furnished sign materials have been ordered and will be ready for timely delivery. Make a physical inspection and inventory to confirm that all state-furnished sign materials are delivered in good condition. After delivery, the contractor is responsible for any damage to state-furnished materials.

4-5603 During the Course of Work

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Inspect both overhead sign structures and roadside signs.

4-5603A Overhead Sign Structures

Sign structures often involve many details that are critical to the structures' permanence. Although maintaining sign structures is expensive, attention to detail during construction can mitigate future problems.

The resident engineer has final responsibility for ensuring that signs and sign structures are constructed in accordance with the contract. The resident engineer also has final responsibility for making any changes that are necessary to serve the public as the designer intended. To perform the required duties properly, the resident engineer must obtain the relevant technical data. For overhead signs and bridge-mounted signs, copies of Section 168-1.0, "Bolted Connections for Overhead Sign Structures," and Section 170, "Structural Steel," of Volume II of the *Bridge Construction Records and Procedures Manual* will provide the information.

Construction inspectors should check the following items or perform the following duties:

- Upon delivery, check the materials' identification marks or inspection tags (using Form TL-0624, "Inspection Release Tag,") and match these marks and tags against those listed in Form TL-0029, "Report of Inspection of Material." (See Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual for more explanation.) METS will check items for compliance with specifications. These items can also be checked at the source during fabrication. This check will include determining the adequacy of workmanship for activities such as welding, painting and galvanizing and also ensuring the

use of the proper materials. For portable changeable message signs, METS will also ensure that all control components are connected and operating properly before release to the job site.

- Require the repair of any minor damage to galvanizing or coatings, as specified in Section 75-1.05, "Galvanizing," of the *Standard Specifications*.
- Determine that METS has inspected and approved anchorage devices for bridge-mounted signs. Ensure that anchorage devices are installed as recommended by the manufacturer, as shown on the plans, and as specified. For more information on anchorage devices, refer to Section 135, "Miscellaneous Construction Materials," Volume II of the *Bridge Construction Records and Procedures Manual*.
- Ensure the proper type of bolts in field connections. Observe the installation of high-strength bolts to ensure the correct method and sequence for tightening. Refer to Section 170, "Structural Steel," Volume II of the *Bridge Construction Records and Procedures Manual* for the specifications of the American Society for Testing and Materials for high-strength bolts.
- METS inspects welding at the fabrication plant. If welding will be performed at the job site, contact METS for assistance. Also, at the job site, visually check for any obvious defects. During sign erection, ensure a proper fit between the post and the sign frame. Also, verify the provision of the proper minimum clearances.
- Ensure that the surface finishes of all metal parts of sign structures meet specifications. Inspect portions of the work completed in the field.
- Ensure through observation that sign panels and fastening hardware comply with specifications. Ensure that exposed portions of fastening hardware on the panel faces have been finished as specified.
- Ensure that the construction of footing pedestals complies with specifications. It is particularly critical that the contractor correctly position and align anchor bolts for sign bridges.
- To ensure the minimum horizontal and vertical clearances, verify that the location and elevation of the footing pedestals are correct.
- Ensure the contractor performs electrical work according to the specifications.
- Ensure the contractor performs field painting, including touch-up, according to the specifications.
- Examine sign panels for compliance with specified workmanship.
- Whenever an installation exceeds the scope of knowledge of available personnel, request assistance from, or consult with, other units. For instance, you may call upon mechanical and electrical engineers from the Office of Structure Design for assistance with changeable message signs.
- Ensure sign panels over lanes and lane arrows are correctly centered over the appropriate lanes.

- Report any temporary or permanent changes to horizontal and vertical clearances to the Transportation Permits Branch in accordance with Section 3-705A, "Clearance and Bridge Permit Rating Changes (Temporary)," of the *manual.*
- Ensure adherence to the public safety requirements of the special provisions regarding permanent obstacles that are temporarily unprotected.

4-5603B Roadside Signs

Do the following for these types of signs:

- Upon delivery, check the materials' identification marks or inspection tags (using Form TL-0624, "Inspection Release Tag") and match these marks and tags against those listed in Form TL-0029, "Report of Inspection of Material." (See Section 6-2, "Acceptance of Manufactured Material and Sampling Methods," of this manual for more explanation.) METS will check items for compliance with specifications. These items can also be checked at the source during fabrication. Note the type of preservative used to treat wood posts.
- Ensure postholes are located so that the signs will have the correct horizontal clearance and will not be obstructed by other objects. Also, verify that holes are excavated to the full depth and backfilled as specified.
- Ensure the provision of minimum vertical clearances to the bottom of the sign panels, as required by the specifications.
- If posts are cut or drilled in the field, ensure the contractor treats exposed areas as specified.
- Ensure that the attaching of signs to posts complies with requirements.
- You may request the assistance of the district traffic unit. Such assistance may include an actual in-the-field review of sign staking and also day and night observation of completed signage. Include in the daily report notes on assistance received and changes made.

4-5604 Measurement and Payment

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For details of measurement and payment, review contract specifications. Make necessary measurements and counts.